

# Delta Class Remote Transducer Pressure Controller / Flowmeter

## GENERAL FEATURES:

- Pressure Control and Flow Management
- Flow accuracy:  $\pm 1\%$  of rate or (setpoint) including linearity.
- Digital software can store 10 selectable calibration curves. Spares inventories are reduced by limiting the number of individual MFCs required, lowering inventory holding costs.
- DeviceNet Protocol

## Control Response:

- Typical Settling Time of less than 800 ms typical for all step changes. Valve response can be ramped to tailor process requirements. Actual pressure response can depend on system design.
- Proprietary adaptive valve control algorithm is available which assures that unexpected variations in pressure do not cause flow to deviate from setpoint.
- Insensitive to mounting attitude

## Analog I/O:

- 15-pin
- 0-5 Volt setpoint and flow signals
- Single sided +15 Volt DC power supply
- Separate 'valve-override' signal
- Compatible with Brooks' Model 0150 series secondary electronics

## DeviceNet™ Communication Option:

- Easy Commissioning and Reduced System Wiring
- Accessibility of sensor, valve, calibration, tuning, diagnostic, and other internal data, to support fast commissioning.
- MAC-ID, Baudrate rotary switches, and two bi-color status LEDs - to ease setup and addressing as well as status confirmation.
- Standard Device-Profile, ODVA certified
- Capable of: Polled, Cyclic, & Change-of-State messaging.



Model SLA5840A  
Analog I/O

Model SLA5840D  
Digital I/O DeviceNet

## DESCRIPTION

The Brooks® Model SLA5840 Pressure Controller/Flowmeter controls pressure while also measuring flow rate. The Model SLA5840 receives a remote pressure transducer signal, and using adjustable integral PID control electronics and control valve, will maintain a desired set pressure. In addition to the pressure control function, the Model SLA5840 provides a 0-5 V signal which is linear with mass flow rate. The Model SLA5840 can also be configured as a mass flow controller for calibration or test purposes.

Brooks now offers control interface with DeviceNet™, a high-speed (up to 500k baud) digital communication network adopted by the Semiconductor industry. Brooks' communications capabilities and device-profile have been certified by the ODVA™ (Open DeviceNet Vendors' Association). Other network protocols are in development. Talk to your Brooks representative about your specific needs.

The MFC's microprocessor uses a multi-point calibration curve, to deal with residual sensor non-linearity, yielding a highly accurate process signal. The microprocessor then executes Brooks' proprietary Adaptive Valve Control algorithm to rapidly adjust the valve actuation to match setpoint.

## Brooks® Model SLA5840

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Process data and commands may be wired using either traditional 5 volt analog connections or digital communications networks, the measurement and control performance is the same!

The SLA5800 family of products takes advantage of modular design in both mechanical and electrical construction. This modularity allows for simplified customer ordering and factory configuration, enabling Brooks to more easily meet the ever changing needs of our global customers. Brooks' production flexibility translates into reduced lead times for our customers. This flexibility allows products using both traditional analog connections or leading edge network communications protocols.

The SLA5800 series of controllers can directly replace existing analog products bringing with them greatly improved accuracy. Analog and digital applications will see settling time improvements with an insensitivity to varying process conditions, due to Brooks' proprietary Adaptive Valve Control algorithm.

### SPECIFICATIONS:

#### Performance Characteristics:

##### Flow Ranges\*\*

Model SLA5840

Any range from 0-3 sccm to 0-30,000 sccm N<sub>2</sub> eq.

\*\*Standard: 0° and 101kPa (760 Torr). Per SEMI Guideline E12-96.

##### Flow Control Range

(50:1) - elastomeric valve seat

##### Flow Accuracy

±1.0% of rate, including linearity (20% to 100% F.S.),  
±0.2% of F.S. (below 20% full scale)

##### Flow Repeatability

±0.20% of rate

##### Flow Temperature Sensitivity

Zero: Less than 0.05% F.S. per °C  
Span: Less than 0.1% of rate per °C

##### Flow Settling Time

Actual flow:

Less than 800 ms to within ±2% full scale of final value for a 0-100% step.

Constant step response of less than 800 ms for all other transient steps.

#### Performance Characteristics: Pressure

##### Pressure Ranges

#### Analog I/O Pin Connections:

Signal:	15-pin D-conn
Setpoint/Command Common	1
Flow/Signal Out	2
+15v dc power	5
Setpoint/Command In	8
Power Supply Common	9
Output Signal Common	10
+5V reference	11
Valve Override	12
Mode Select Pin	13
External Sensor	15
no-connections	3, 4, 6, 7, 14

Dependent upon remote sensor transducer, maximum 1500 psig.

#### External Sensor Input

Suitable for pressure sensors with maximum 0-10 Vdc output signals.

#### Pressure Control Range

100:1 for elastomer valve seat

#### Pressure Settling Time

Less than 1 second typical for a 20-100% setpoint step with maximum 2% overshoot. Actual pressure response highly dependent on system design.

#### RATINGS:

##### Operating Pressure

1500 psig maximum

##### (PED) Pressure Equipment Directive 97/23/EC:

Equipment falls under Sound Engineering Practice (SEP)

##### Leak Integrity

Inboard to Outboard: 1x10<sup>-9</sup> atm scc/sec Helium max.

##### Ambient Temperature Limits

Operating: 0°C to 60°C (32°F to 140°F)

Non-Operating: -25°C to 100°C (-13°F to 212°F)

##### Fluid Temperature Limits

0°C to 65°C (32°F to 149°F)

#### Physical Characteristics:

##### Materials of Construction

316L Vacuum Arc Remelt (VAR), 316L, and high-alloy ferritic stainless steel.

Valve Seat: fluoroelastomers, Buna-N, Kalrez®

External/internal seals: Viton® fluoroelastomers, Buna-N or Kalrez®

Internal Wetted Surface Finish: 32 Ra

**Outline Dimensions**

Refer to Figures 1 & 2.

**Process Connections**

Refer to Figures 1 & 2.

**Electrical Characteristics:**

**Electrical Connections**

Analog I/O option: 15-pin, male  
 Digital I/O DeviceNet option: 5-pin Micro-Connector male.

**Power Supply Voltage**

Analog I/O option: +15 Vdc, ±5%  
 (traditional -15 Vdc pin is ignored)  
 Digital I/O DeviceNet option: 11 - 25Vdc

Power Requirements	Watts, typ.	Watts, max.
Analog I/O option, with valve:	2.6	4.0
Digital I/O DeviceNet option, with valve:	4.9	7.6

**Flow Output (Analog I/O option only)**

0-5 Vdc into 2K ohm minimum load.  
 Output will indicate process variable up to 6 Vdc (120% F.S.).

**Valve Override Signal (Analog I/O option only)**

Left floating/unconnected – instrument controls valve to command setpoint  
 Connected to signal at or above 5.0 Volts – valve is forced open  
 Connected to signal at or below 0.0 Volts – valve is forced closed

**5 Volt Reference Signal (Analog I/O option & 15 PIN only)**

5.0 Vdc + 0.2% output available for potentiometer command setpoint input ( 1K ohm minimum load).

**Mode Select Signal (15 Pin Only)**

Select whether to control in external sensor (pressure) mode or flow mode.

**Setpoint Input (Analog I/O option only)**

0-5 Vdc: Input will accept signals to 5.5 Vdc (110% F.S.).  
 Input resistance: 360K ohm min.

**EMC Directive (89/336/EEC) per 61326.**

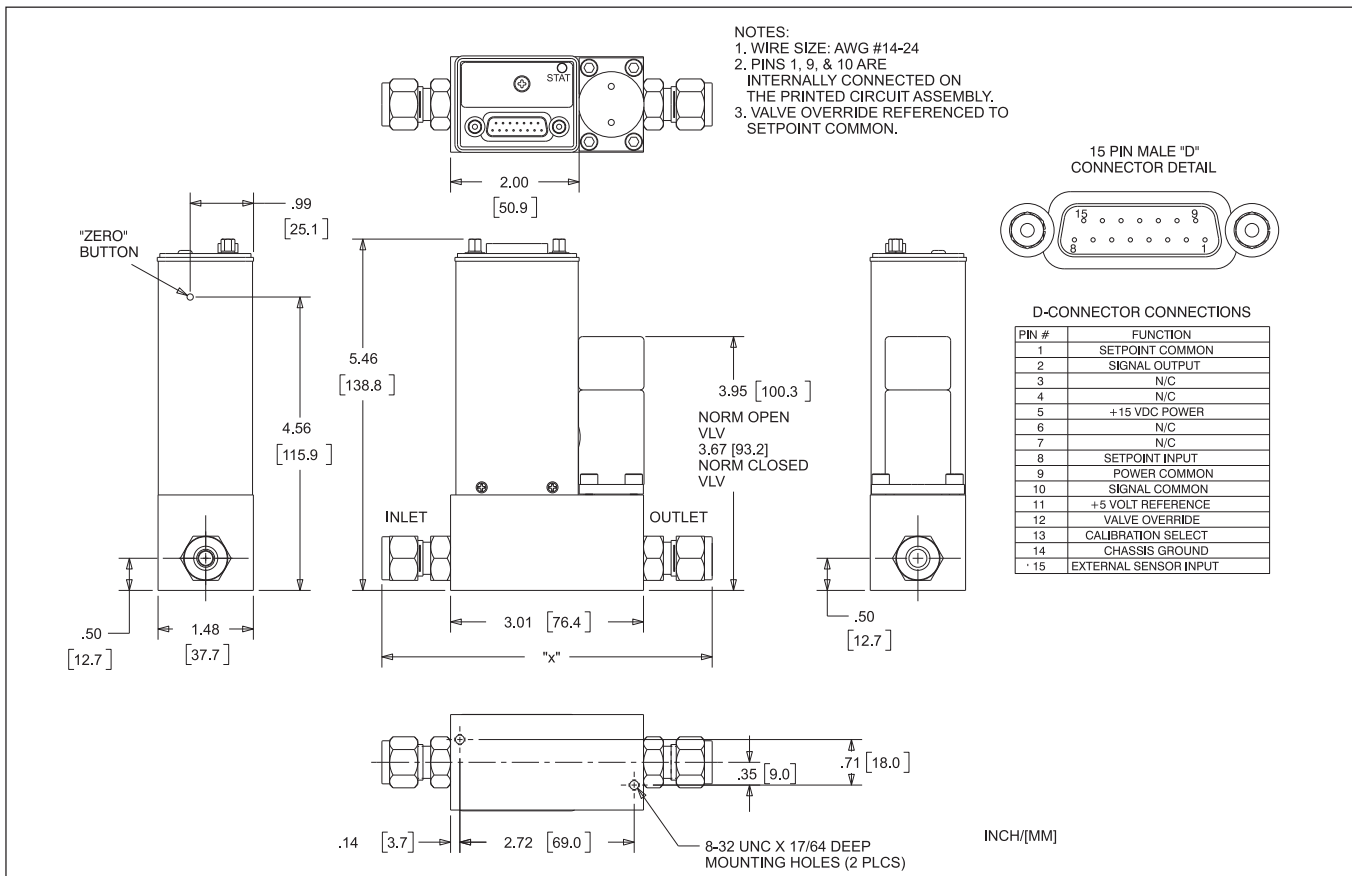


Figure 1 Model SLA5840 Analog I/O Controller with 1/4" Tube Connections

Brooks® Model SLA5840

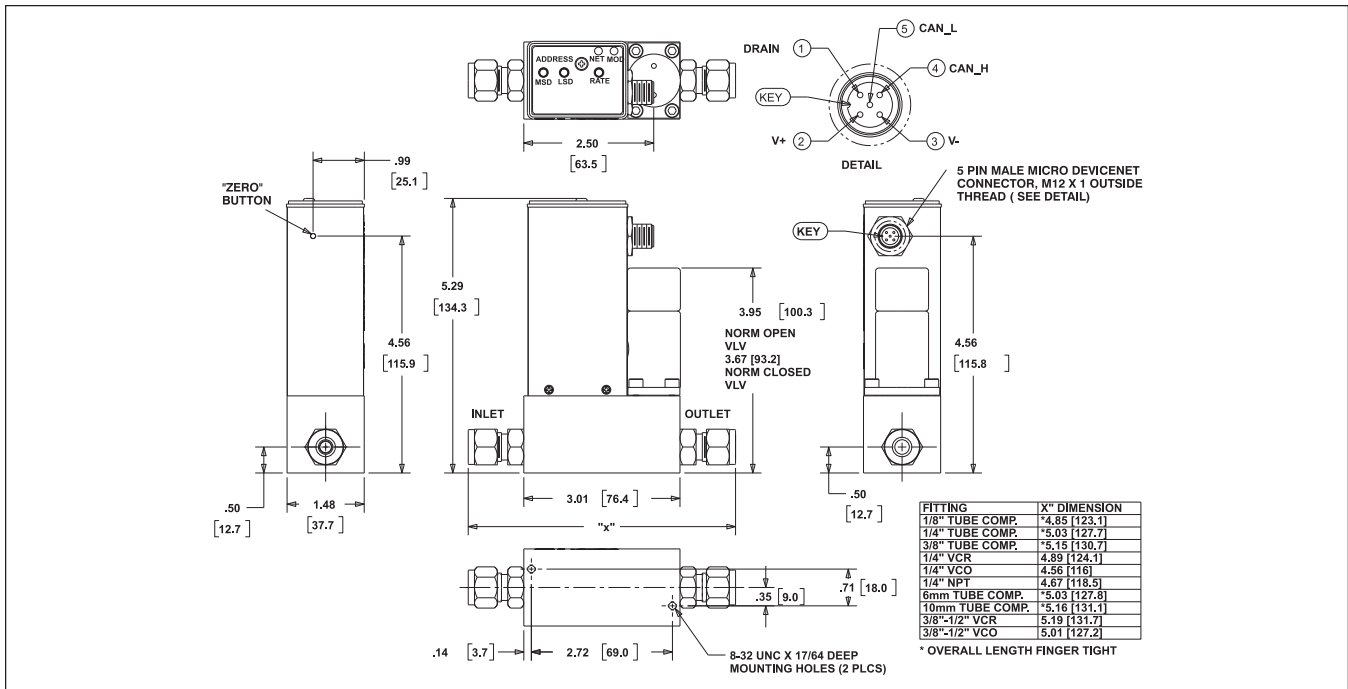


Figure 2 SLA5840 Digital I/O DeviceNet Controller with 1/4" Tube Connections

**BROOKS SERVICE AND SUPPORT**

Brooks is committed to assuring all of our customers receive the ideal flow solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration. The primary standard calibration equipment to calibrate our flow products is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards.

Visit [www.BrooksInstrument.com](http://www.BrooksInstrument.com) to locate the service location nearest to you.

**START-UP SERVICE AND IN-SITU CALIBRATION**

- Brooks Instrument can provide start-up service prior to operation when required, if necessary under in-situ conditions, and the results will be traceable to the relevant international quality standards.

**CUSTOMER SEMINARS AND TRAINING**

- Brooks can provide customer seminars and dedicated training to engineers, end users and maintenance persons.

**HELP DESK**

In case you need technical assistance:

- Americas ☎ 1 888 554 FLOW
- Europe ☎ +31 (0) 318 549 290
- Asia ☎ +81 (0) 3 5633 7100



Due to Brooks Instrument's commitment to continuous improvement of our products, all specifications are subject to change without notice.

**TRADEMARKS**

Brooks ..... Brooks Instrument, LLC  
DeviceNet ..... Open DeviceNet Vendors Association, Inc.  
Kalrez ..... DuPont Dow Elastomers

ODVA ..... Open DeviceNet Vendors Association, Inc.  
TruCal ..... Brooks Instrument, LLC  
VCR ..... Cajon Co.  
Viton ..... DuPont Performance Elastomers

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